

Title: Go for the Electronic Gold

Brief Overview:

Today's society is a globally oriented one. We move, change jobs, and frequently travel more often to other parts of the country and the world. With this in mind, today's youth need to be versed in all parts of our society. We study many countries and cultures. Today, we buy and sell goods all over the world from the Internet. Determining the foreign currency exchange, students can decide what goods to buy, knowing the value in American dollars. After exploration of foreign currency exchanges, students will apply this knowledge to shop for quality Olympic equipment on the Internet.

Links to NCTM 2000 Standards:

- **Mathematics as Problem Solving, Reasoning and Proof, Communication, Connections, and Representation**

These five process standards are threads that integrate throughout the unit, although they may not be specifically addressed in the unit. They emphasize the need to help students develop the processes that are the major means for doing mathematics, thinking about mathematics, understanding mathematics, and communicating mathematics.

Students will apply problem solving skills in a real-life situation. They will make comparisons between five different currencies. They will compare fluctuations in daily currency rates over time. Students will analyze the data and explain trends. They will report on their conclusions with charts, graphs, and written justification. Last of all, students will apply skills and concepts to the international marketplace.

- **Number and Operation**

Students will develop, analyze, and explain methods for solving problems involving proportions.

- **Data Analysis, Statistics and Probability**

Students will organize and analyze data. They will create scatter plots and box-and-whisker plots. Students also will find the mean, median, mode, and range of a set of data. They will describe and interpret the spread of data. Last of all, they will examine and interpret relationships between two variables using tools such as scatter plots.

Grade/Level:

Grades 6, 7, and 8

Duration/Length:

The learning unit is designed for twelve classroom days and the performance assessment is designed to be completed over a period of time determined by the teacher.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Collecting and analyzing data
- Working cooperatively in a real-life problem solving activity
- Finding mean, median, mode, and range for a set of data
- Solving proportions to find a missing variable
- Using a graphing calculator to display and graph data (optional)

Student Outcomes:

Students will:

- determine a connection between the money system in America and other countries.
- gather and record data.
- use proportions to make currency conversions.
- make comparisons and draw conclusions using data.
- organize data in line and bar graphs and box-and-whisker plots (graphing calculator optional).
- apply mean, median, mode, and range.
- present findings and show applications from collected data.

Materials/Resources/Printed Materials:

- Daily newspaper - Business Section
- Graphing calculator (optional)
- Graph paper
- Almanac
- Encyclopedia
- Internet:
World Currency Exchange
<http://www.rubicon.com/passport/currency/>

Sports equipment sites

www.skatecity.com/index/skate_shops/
www.all*sport.com
www.k2-japan.com.jp/98ski.html/
www.mhbhockey.com/
www.iceskating.org
www.anymountain.com
www.internationalski.com
www.gear.com
www.ccmsport.com
www.skiequipment.com

Development/Procedures:

• Day 1:

The students will work cooperatively in a group to discuss money and Internet shopping. If Internet access is available, the students will explore shopping (without buying) in both the American and foreign markets on the Internet.

The students will use a K-W-L chart (Worksheet 1) to organize their thinking. Students will list information in the first column that they already **K**now about money and Internet shopping, list the information they **W**ant to know in column two, and leave the last column blank. The teacher will explain to the students that they will complete the last column later with the information that they have **L**earned.

The teacher will lead a discussion on world economies. Students will discuss the money system in America, the names of various foreign currencies, and the currency rates worldwide. The teacher will discuss buying products on the Internet.

- **Day 2:**

The students will be given five consumer items and will select five items of choice. They will determine the cost in American dollars. The students will record their findings in a chart. The students will be given a copy of the Foreign Currency Exchange Rate table. The teacher will introduce how to read the Foreign Currency Exchange Rate table from the newspaper. The students will convert cost of the ten consumer items into the following foreign currencies: Mexican pesos, Japanese yen, Canadian dollars, and choose one currency of choice. The students will record information on the chart: Price Conversion (Worksheet 2A).

- **Days 3-10:**

The students will record the list of currency exchange rates (for the four countries) from the daily newspaper for eight consecutive days. The students will record the information on the chart: Daily Currency Exchange Rates (Worksheet 3). The teacher will ask leading questions regarding foreign currency information, with particular emphasis on comparing the daily fluctuations between the currencies.

- **Day 11:**

The students will find the mean, median, mode, and range for each list of individual foreign exchange rates over time. The students will create line, bar and box-and-whisker plots (graphing calculator or pencil-and-paper) for each of the individual foreign exchange rates. They will describe and interpret the information using the chart: Measures of Central Tendency (Worksheet 2B). During closure, the teacher will ask the students to compare and contrast the different kinds of graphs.

- **Day 12:**

The teacher will return to the K-W-L chart (Worksheet 1) and describe what they have learned. The teacher will assign the final performance assessment project.

Performance Assessment:

Students will be assessed throughout the unit by using the scoring rubric for the following activities: Price Conversions, Daily Currency Exchange Rates, Scatter Plots, Box-and-Whisker Plot, and final assessment project.

Extension/Follow Up:

Students can implement their proportion skills to determine the value of stocks when given the amount of shares. The students can research foreign stock markets and discover the effect of the currency exchange rate on the value of stock.

Authors:

Carol Lawson
John J. Wright Middle School
Spotsylvania, VA

Elizabeth Purcell
Rappahannock County Middle School
Rappahannock County, VA

George T. Jones
Bayside Middle School
Virginia Beach, VA

Sister Barbara Colligon
St. Michael
Fairfax County, VA

Eloise K. Griffin
St. Theresa
Loudon County, VA

K-W-L

[illegible]

Measures of Central Tendency

1. Complete chart at bottom.

2. Which country has the greatest

mean? _____

median? _____

range? _____

mode? _____

3. Which currency is the most stable? Justify your answer.

4. Using Worksheet #2, identify the day that would present the most ideal (highest conversion rate to US\$) shopping day for each currency .

Peso _____

Yen _____

Canadian \$ _____

Other _____ (name:)

Identify	Mean	Median	Range	Mode
U.S.A.				
Canada				
Japan				
Mexico				
Other				

Daily Currency Exchange Rates

[illegible]

Equipment Cost USA

*The total spent cannot exceed \$5000.00

Sports Item	Cost in US \$	Convert to _____	Convert to _____
Total			

CONVERSIONS

Foreign Price B

Name of Country: _____

Name of Currency:_____

[illegible]

Final Performance Assessment

You are a member of the United States Winter Olympic Team. In order to participate, you will need equipment to practice and compete in the Olympics. Your task is to purchase the best equipment available internationally in a given price range.

The following tasks need to be included in the performance assessment:

1. Choose a competitive Winter Olympic sport.
2. Determine a list with the equipment needed to participate in the sport.
3. Determine the cost of the equipment using American dollars.
Your budget may not exceed \$5,000.
4. Establish a finalized budget of equipment and prices.
5. Select two countries where your sport is considered a national pastime.
6. Locate (using the Internet or other sources) the prices of essential equipment from your two chosen countries.
7. Using the Currency Exchange Rate table, figure out the cost of the equipment converting the foreign country price to American dollars.
8. Organize your equipment list and budget. Explain where you bought equipment for the “best price” in a report for your coach.
9. Create an oral presentation that should include a poster illustrating the mathematical concepts used in making your purchases.

Rubrics for Daily Worksheets

Price Conversions

- 4 Ten items have been selected. Students have written proportions in order to find equivalent prices in 4 currencies. Conversions are at least 90% accurate. Work is neat and easy to read.
- 3 Ten items have been selected. Students have written proportions in order to find equivalent prices in 4 currencies. Conversions are at least 80% accurate. Work is neat and easy to read.
- 2 Ten items have been selected. Students have written proportions in order to find equivalent prices in 4 currencies. Conversions are at least 70% accurate. Work is neat and easy to read.
- 1 An effort has been made to do the assignment. Prices have been correctly entered on Worksheet #2. Proportions have been written. Accuracy is less than 70%. The work is poorly organized and difficult to read.

Daily Currency Exchange Rates

- 4 Data is accurately recorded. Data is completed for each day of the recording period. The chart is neat and legible.
- 3 Data is mostly present. Data displayed is accurate and easy to read.
- 2 Data is mostly present, however there are errors in data record.
- 1 An effort has been made to record the data. Data is incomplete and numerous errors are present

Rubrics for Graphs

Scatter Plots

- 4 Axes are correctly labeled, title included, data correctly recorded, intervals are correct and appropriate. Work is neat and easy to read.
- 3 Axes are correct. Title is included. Minor errors in data and interval. Work is neat and easy to read.
- 2 Errors in labeling axes or title. Significant errors in data. Work is legible.
- 1 An effort has been made to complete the graph.

Box-and-Whisker Plot

- 4 Graph is titled with appropriate intervals. Student has drawn the correct median, quartiles, extremes, and outliers. Graph is neat and easy to read.
- 3 Title is present. Intervals, medians and quartiles are correct. Graph is easy to read.
- 2 An error is present in one the major components: interval, median or quartile. Work is titled and neat.
- 1 Effort has been made to do the assignment. Major errors are present in the graph. The work is difficult to read.

Rubric for Assessment Project

- 4 Sport is a competitive winter sport.
Equipment needed in a complete list.
Cost of equipment is within budget.
The two foreign countries enjoy this sport.
American cost conversion from two foreign currencies are accurate.
Final equipment list with choice of buying location is accurate.
- 3 Most project requirements are completed.
Calculations are reasonable.
Adequate support and/or detail.
- 2 Some requirements are completed.
Fair support and/or details.
Calculations are mostly accurate.
- 1 Minimal requirements are completed.
Poor support.
Calculations have been attempted.

Oral Presentation Rubric

- 4 Student is well prepared and knowledgeable.
Props/poster are well done and appropriate for chosen sport.
Student explanation is well done, clear, concise and informative.
- 3 Student is fairly well prepared and knowledgeable.
Props/poster etc. are fairly knowledgeable.
Explanation is fairly well done.
- 2 Student is somewhat prepared and knowledgeable.
Explanation is fair.
- 1 Student has made a poster and brought in props but is not prepared and/or knowledgeable.